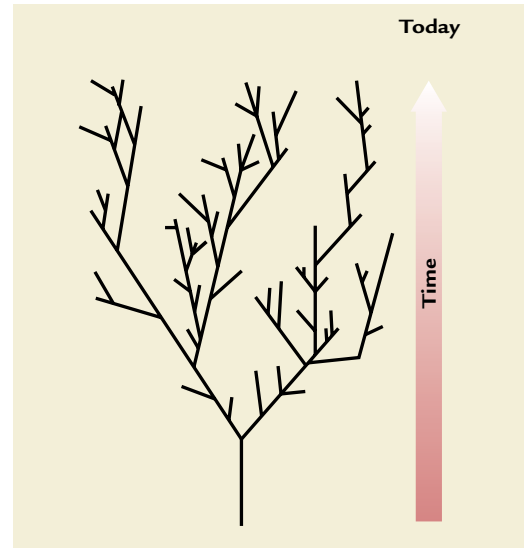


# 101 Birds of a Feather?



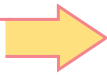
**B**y comparing fossil evidence with living species, it is clear that almost all the species that have ever lived on Earth have become extinct. As this diagram shows, most living species are descended from a small fraction of the species that have ever existed.

Why do some species survive while others disappear? Species die out for many reasons. These include environmental change, competing species, habitat loss, and disease. Human activity can contribute to each of these causes.



*Wherever a “branch” of this evolutionary tree of species ends, an extinction occurred (except at the present day).*

## CHALLENGE



**How does natural selection help explain the extinction of the dodo bird and the success of the common pigeon?**

### MATERIALS



*For each student*

- 1 Student Sheet 101.1, “Three-Level Reading Guide: Birds of a Feather?”
- 1 Student Sheet 101.2, “Discussion Web: Should Dodos Be Re-created?”

## PROCEDURE

Use Student Sheet 101.1, “Three-Level Reading Guide: Birds of a Feather?” to guide you as you complete the following reading.

## RELATED BIRDS, DIFFERENT FATES

The common pigeon seems to be everywhere—almost everyone has seen one of these birds. No one alive today has seen a dodo bird, and no preserved specimens of this extinct species exist. There are 27 orders of birds. Based on skeletal comparisons, the dodo and the pigeon have been classified in the same order for a long time. In 2002, scientists were able to take a DNA sample from a dodo that was preserved at a London museum. DNA analysis confirmed that the dodo is closely related to many modern pigeons. The pigeon and the dodo are evolutionary cousins!

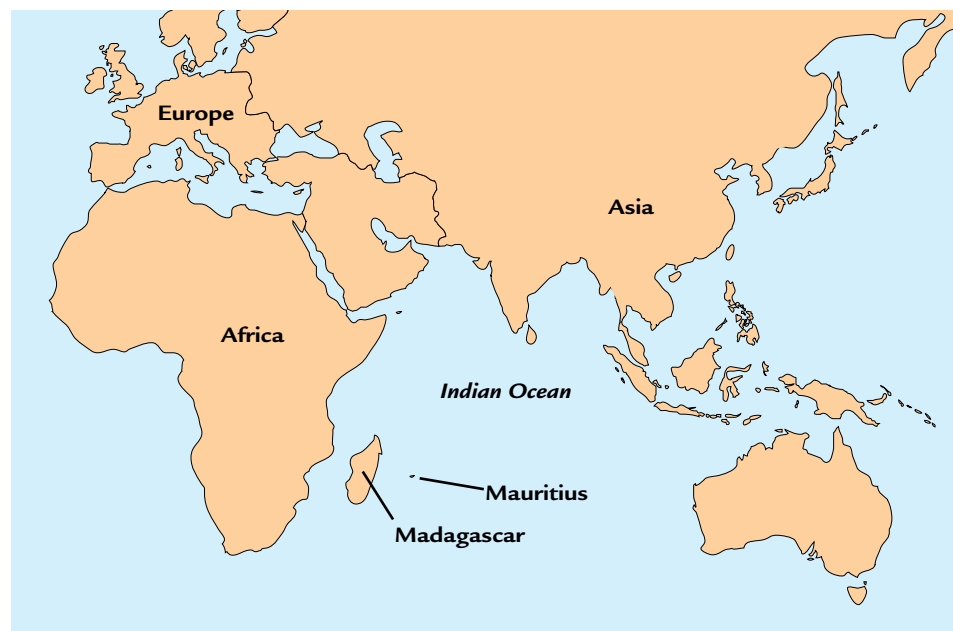
### The Dodo Bird

Often portrayed as flightless, fat, slow, and stupid, the dodo bird (*Raphus cucullatus*) has become a symbol for something out-of-date or clumsy. Some people think it somehow fitting that the dodo species went extinct. How could natural selection have produced such a creature in the first place?

Dodos lived successfully for several million years on the island of Mauritius in the Indian Ocean (see the map, below). Migratory birds probably had settled on Mauritius long before, just as Darwin’s finches did on the Galapagos Islands. Contrary to popular belief, evidence shows that the flightless dodo was a slender, fast-running animal (see photo next page). Although it com-

#### LOCATION OF MAURITIUS

*Mauritius is a volcanic island about 10 million years old, about 500 miles east of Madagascar. Today, it is an independent country with a population of over 1 million people.*



## Activity 101 • Birds of a Feather

peted for resources with many other bird species, the 30- to 50-pound dodo had few predators on the island. Without predators, dodos could nest on the forest floor and eat fruit that fell from trees. Flight was unnecessary for survival and so, over many generations, the new species evolved to become flightless.

In 1505, Portuguese sailors became the first mammals to set foot on Mauritius. Soon, the island became a common stopping place for ships travelling between Europe and Asia. Because of its large size and inability to fly, the dodo became a hunting target for hungry sailors. Because dodo nests were on the ground, their eggs were easily found and eaten by the rats, pigs, monkeys, and other animals that accompanied the sailors. In addition, human settlers' need for cleared land and wood greatly reduced the size of the dodo's forest habitat. In 1681, less than 200 years after the first predators arrived on Mauritius, the last dodo bird was killed.

### WHAT REMAINS OF THE DODO

*Made of bones gathered from the island during the 1850s, this skeleton confirms that the dodo was flightless, but not that it was slow-moving.*



*Penguins, as well as kiwis and ostriches, are examples of living species of flightless birds.*



## The Common Pigeon

Native to Europe and Asia, pigeons now thrive on five continents. The common pigeon, or rock dove (*Columba livia*), was first domesticated by humans between five and ten thousand years ago. Early humans raised the birds for food, and pigeon meat is still a delicacy in many cultures. Later, pigeons were bred to race, to deliver messages, to do stunts, and for show (see below).

Perhaps even before becoming domesticated, pigeons discovered that human structures were convenient, safe places to nest. In addition, fields and marketplaces provided an easy-to-gather, year-round food supply. During their several thousand years of close association with humans, human-bred pigeons have escaped and mated with wild pigeons, sharing genes with them. As a result, pigeon populations found near people, known as feral pigeons, are quite different from wild pigeons. They can fly faster and for longer distances, breed earlier in life, produce more offspring, and live at a much higher population density. The remaining population of wild pigeons is decreasing, and may soon dwindle to zero. Meanwhile, the population of feral pigeons continues to grow.



### PIGEON DIVERSITY

*Over many generations, through both natural processes and breeding, the pigeon species has evolved adaptations to many successful lifestyles associated with the human species.*

## ANALYSIS



1. If humans had never interacted with either the dodo or the pigeon, how do you think the history of each species would be different? Explain your reasoning.
2. Could the evolution of feral pigeons be described as the formation of a new species? Explain.
3. Use natural selection to explain how the flying bird that first settled on Mauritius might have evolved into the flightless dodo. In your answer, be sure to include the role of mutations.



4. Your friend argues that the dodo bird became extinct because it was a poorly adapted species, destined for failure. Do you agree? Explain.
5. Imagine that advances in science and technology allow genetic engineers to re-create living dodo birds and mammoths.



a. Should mammoths be re-created and released into the Arctic ecosystem? Support your answer with evidence and discuss the trade-offs of your decision.



b. Should dodos be re-created and released into the ecosystem of modern Mauritius? Support your answer with evidence and discuss the trade-offs of your decision.

**Hint:** To write a complete answer, first state your opinion. Provide two or more pieces of evidence that support your opinion. Then discuss the trade-offs of your decision.



## EXTENSION

Find out more about extinct and endangered species. Start at the *Issues and Life Science* page of the SEPUP website.